

Memorandum

Date: November 2, 2018
To: William Lee
CC:
From: Tim Rooper
Subject: Chemsol OU-3 Off-Site Remedial Investigation
August 2018 OSW Sampling Event
Project No.: 160688

This Technical Memorandum presents results from sampling of the eight off-site well locations (OSW-1 through OSW-8, all sampling ports) completed in August 2018. The off-site well locations were sampled in response to the June 19, 2018 comments from the United States Environmental Protection Agency (USEPA) regarding the January 26, 2018 Technical Memorandum submitted by Cornerstone Environmental Group (Cornerstone) that presented the analytical results from the third round of sampling at locations OSW-7 and OSW-8. In the June 19, 2018 comment letter, the USEPA requested that at least two more rounds of data were required from locations OSW-7 and OSW-8 before EPA would be prepared to determine whether or not additional off-site wells are required in order to adequately define the plume. By memorandum dated August 6, 2018, it was agreed that two more rounds of sampling would be completed. The first round of sampling was to include all available off-site wells (OSW series) and sampling ports; and would be collected contemporaneously with the August 2018 semiannual on-site (OU-2) Long Term Monitoring Program (LTMP) sampling event. The second round of sampling will be completed contemporaneously with the February 2019 semiannual LTMP sampling event and would be limited to off-site wells and sampling ports with detectable concentrations of site constituents as recommended based on the August 2018 sampling results.

This memorandum presents the results obtained from samples collected in August 2018 from the off-site well locations and includes recommendations for the sampling event to be completed in February 2019. Following receipt of the February 2019 results, a subsequent



memorandum will be provided summarizing the results along with recommendations for proceeding to the next phase of investigation.

Description of Sampling Event

Samples were collected from the eight off-site well locations (OSW-1 and OSW-8) shown in Figure 1. Sampling was completed consistent with approved protocols which include purging each sampling port two times, followed by collection of the sample directly from the sample port tubing into laboratory provided glassware. The collected samples were then stored on ice and transported under chain of custody to Test America Laboratory for analysis of Target Compound List (TCL) volatile organic compounds (VOCs).

Field parameters recorded at the time of sampling are shown in attached Table 1, a comparison of historical field parameters are shown in Table 2, and the current and historical analytical results are summarized in Table 3.

By way of background, the sampling locations, sampling port depths and water bearing units monitored and discussed in more detail below consist of the following:

Location and Sampling Port (P)	Water bearing zone and depth below ground surface.	Location and Sampling Port (P)	Water bearing zone and depth below ground surface.
OSW-1 P1	Upper Permeable 233 - 243	OSW-5 P1	Upper Permeable 90 - 100
OSW-1 P2	Principal 290 - 300	OSW-5 P2	Upper Permeable 258 - 268
OSW-1 P3	Principal 350 - 360	OSW-5 P3	Principle 314 - 324
OSW-1 P4	Principal 400 - 410	OSW-5 P4	Principle 360 - 370
OSW-1 P5	Lower Bedrock 520 - 530	OSW-5 P5	Principal 434 - 444
		OSW-5 P6	Lower Bedrock 529 - 539
OSW-2 P1	Upper Permeable 70 - 80	OSW-6 P1	Upper Permeable 205 - 215
OSW-2 P2	Upper Permeable 190 - 200	OSW-6 P2	Principal 264 - 274
OSW-2 P3	Principal 250 - 260	OSW-6 P3	Principal 342 - 352
OSW-2 P4	Principal 315 - 325	OSW-6 P4	Principal 415- 425
OSW-2 P5	Principal 380 - 390	OSW-6 P5	Lower Bedrock 458- 468
OSW-2 P6	Lower Bedrock 468 - 478		

OSW-3 P1	Upper Permeable	70 - 80	OSW-7 P1	Upper Permeable	50 - 60
OSW-3 P2	Upper Permeable	130 - 140	OSW-7 P2	Upper Permeable	185 - 195
OSW-3 P3	Principal	200 - 210	OSW-7 P3	Principal	290 - 300
OSW-3 P4	Principal	264 - 274	OSW-7 P4	Principal	430 - 440
OSW-3 P5	Principal	350 - 360	OSW-7 P5	Lower Bedrock	460 - 470
OSW-3 P6	Lower Bedrock	410 - 420	OSW-7 P6	Lower Bedrock	510 - 520
			OSW-7 P7	Lower Bedrock	530 - 540

OSW-4 P1	Upper Permeable	93 – 103	OSW-8 P1	Upper Permeable	65 - 75
OSW-4 P2	Principal	146 - 156	OSW-8 P2	Upper Permeable	160 - 170
OSW-4 P3	Principal	210 - 220	OSW-8 P3	Principal	255 - 265
OSW-4 P4	Principal	280 – 290	OSW-8 P4	Principal	350 - 360
OSW-4 P5	Lower Bedrock	370 - 380	OSW-8 P5	Principal	445 - 455
			OSW-8 P6	Lower Bedrock	470 - 485
			OSW-8 P7	Lower Bedrock	528 - 543

Sampling Results

The results of the recent sampling event and comparison to prior sampling results are discussed below for the Phase I (OSW-1, OSW-2, OSW-3 and OSW-4) and Phase II (OSW-5 and OSW-6) locations followed by discussion of the Phase III (OSW-7 and OSW-8) locations.

OSW-1, OSW-2, OSW-3, OSW-4, OSW-5, and OSW-6

Cornerstone representatives collected groundwater samples from OSW-1 through OSW-6 with the objective of generating water quality data for comparison to data collected during prior sampling events to evaluate potential changes in water quality that may be attributable to ongoing operation of the on-site groundwater extraction system¹.

With respect to field parameters, most of the ports at OSW-1, OSW-2, and OSW-4 generally indicate lower dissolved oxygen (DO) and lower Redox Potential (Redox) as compared to prior results, while the ports in OSW-3, OSW-5, and OSW-6 generally showed higher DO and lower Redox compared to the Fall 2017 results. Overall, the results generally indicate mild reducing to sometimes mild oxidizing conditions. The pH, turbidity, and specific conductivity results are generally consistent with historical data with pH generally neutral, low specific conductivity, and generally low turbidity.

¹EPA's selected remedy for on-site groundwater is on-site containment with mass removal to the extent practicable, which became fully operational in January 2011. Contaminant concentration in the downgradient off-site wells is expected to be affected by this multi-year pumping operation.

With respect to well OSW-1, comparison of the recent analytical results to historical data (Table 3) indicates that this well continues to demonstrate low levels (generally single digit concentrations) of site contaminants of concern (COCs) consisting of carbon tetrachloride and trichloroethene in the deepest sampling port (P5), and typically non-detectable concentrations in shallower ports P1 through P4. 1,4-dioxane was reported at sampling ports P1, P4 and P5 at lower concentrations as compared to historical data, while it was higher at ports P3 and P4 (please see additional discussion regarding 1,4-dioxane below).

With respect to wells OSW-2 and OSW-3, results from most sampling ports exhibit an overall declining trend in site COCs. This declining trend is likely attributable to the effects of the upgradient groundwater extraction wells located along the northern Chemsol property boundary.

With respect to well OSW-4, data are generally comparable to recent data with 1,4-dioxane being the only constituent reported above applicable New Jersey Groundwater Quality Standards (NJGWQS).

With respect to well OSW-5, port P1 has historically had minimal detectable VOCs and remains generally consistent with historical results. Likewise, data from ports P2, P3, P4, P5, and P6 remain generally consistent with historical water quality results with only slight variations. OSW-5 is located further downgradient of the on-site groundwater extraction system referenced above, and as such the effects of the groundwater extraction system (i.e. declining concentrations) would be expected to take longer to become evident; it is anticipated that reductions in COCs within OSW-5 will be observed in the future. However, the effect of matrix diffusion on the groundwater concentrations within OSW-5 is also evident in the overall consistency of the data as evident by the persistence of individual COCs detected at concentrations above the NJGWQS.

Finally, the results from OSW-6 are consistent with the prior four sampling events with all constituent concentrations below applicable NJGWQS, except for 1,4-dioxane.

OSW-7 and OSW-8

The field parameters at OSW-7 and OSW-8 generally indicate an increase (higher negative value) in redox values, with the exception of OSW-7 P1 and OSW-8 P1, P2, and P3 that show a lower negative value compared to previous events, but still mildly reducing. The DO results are more variable, but in conjunction with the redox values are indicative of

more oxygenated water within the shallower ports, while the deeper sampling ports represent groundwater associated with a slightly more reducing geochemistry that would be anticipated at depth. More reducing conditions with depth (i.e. at the deeper sampling ports) is also consistent with the upward gradients observed at OSW-8 that results in deeper groundwater moving up from elevations below -400 feet amsl as discussed further below.

The VOC results summarized in Table 3 are generally consistent with prior sampling results at both OSW-7 and OSW-8. Specifically, trichloroethene was detected above its Groundwater Quality Standard (GWQS) of 1 µg/l at OSW-8 Ports P3, P4, and P5 at a maximum concentration of 12 µg/l, but was not detected within deeper sample ports P6 or P7. Moreover, while carbon tetrachloride was detected above its groundwater quality standard of 1 µg/l at OSW-8 Ports P3 and P4 at a maximum concentration of 7.0 µg/l, it was not detected within deeper sample ports P5, P6, or P7. Neither trichloroethene or carbon tetrachloride were detected (ND) in any of the sampling ports at OSW-7. Concentrations of these site COCs (i.e., trichloroethene and carbon tetrachloride) measured at the Chemsol northern property boundary at well cluster MW-203 and at off-site wells OSW-2, OSW-5 and OSW-8 in August 2018, as well as historically, are illustrated in Figures 2 and 3. This cross section represents a downgradient flow path within the center of the plume and illustrates that concentrations decline sharply downgradient of OSW-5. Additionally, and as discussed further below, the zone of capture developed by the Chemsol groundwater extraction system extends north (downgradient) of the Site within both the Principal and Lower Bedrock aquifers such that a groundwater divide is formed north of OSW-5 (i.e., between OSW-5 and OSW-8) as also shown on Figures 2 through 4 and discussed further below.

Also consistent with prior sampling results, the compound 1,4-dioxane (analyzed via method 8260 SIM) exceeds the GWQS of 0.4 µg/L in all of the collected samples at locations OSW-7 and OSW-8. Concentrations of 1,4-dioxane along the same flow path discussed above are illustrated in Figure 4. Concentrations at OSW-7, which is not within the cross section presented on Figure 4 are presented in Table 3. As shown on Table 3, 1,4-dioxane is the only constituent above GWQS at OSW-7, while the Site COCs carbon tetrachloride and trichloroethene are not detected at OSW-7.

As noted in previous Technical Memorandum, 1,4-dioxane is analyzed and reported as a VOC and historical concentrations have shown significant variability over time. The observed variability may in part be associated with the analytical method. While analysis

for 1,4-dioxane via Method 8260 (i.e. as a VOC) is an approved method, recent advances in analytical methodology indicate that analysis using Method 8270 (i.e., as an SVOC) with isotope dilution provides more consistent and repeatable results. As other site COCs (e.g. carbon tetrachloride, trichloroethene, and chloroform) can be used to identify the plume, and to be consistent with historical data, the interim sampling events have analyzed 1,4-dioxane using Method 8260. However, as agreed to with USEPA, 1,4-dioxane will be analyzed using Method 8270 with isotope dilution during the future comprehensive sampling event called for in the RI/FS work plan.

Prior technical memorandum concluded that the 1,4-dioxane concentrations at OSW-7 were not related to the Chemsol site as the concentrations at OSW-7 were notably higher than those observed at OSW-8 and the site COCs carbon tetrachloride and trichloroethene are not detected at OSW-7. However, the 1,4-dioxane concentrations during this sampling event (August 2018) were generally similar at OSW-7 and OSW-8, with concentrations at OSW-7 marginally lower. Given the absence of other site-related COCs, the 1,4-dioxane concentrations at OSW-7 are likely associated with another source; however, the relative magnitude of the 1,4-dioxane concentrations reported during this sampling event do not independently support this conclusion and further assessment will be completed following the February 2019 sampling event.

Using data collected on September 7, 2018, Figure 5 presents groundwater equipotential contours in cross section originating at the Chemsol northern property boundary (MW-203 well cluster) through OSW-2, OSW-5 and OSW-8. This figure clearly illustrates the upward gradients and groundwater divide developed by the Chemsol groundwater extraction system. Groundwater capture from the Chemsol extraction system extends off-site to the north in both the Principal Aquifer and the Lower Bedrock. Additionally, hydraulic heads measured at OSW-7 (see Table 4), which is located just west of the cross section presented in Figure 5, are typically higher than the heads measured at OSW-5 and OSW-8. This difference indicates that OSW-7 is west of the flow path from the Chemsol site to the downgradient discharge point represented by the municipal water supply wells to the north. As such, MW-7 is located cross-gradient from the site COC flow path and indicates that OSW-8 represents the downgradient leading edge of the Chemsol plume.

Summary and Recommendations

The August 2018 sampling results from the Phase I (OSW-1, OSW-2, OSW-3, and OSW-4) and Phase II (OSW-5, OSW-6) wells provide a basis for comparison to data collected during

previous sampling events. These findings indicate that the on-site groundwater extraction results in the creation of a hydraulic divide located between wells OSW-5 and OSW-8 as depicted on Figure 5. As such all site related contamination from OSW-5 and south of OSW-5 is hydraulically captured by the on-site groundwater extraction system. This hydraulic capture system is contributing to declining concentrations at off-site wells outside of the zone of capture (OSW-8 and beyond) by elimination of a continuing source of COCs to locations north of the hydraulic divide. While the effects of matrix diffusion on the overall consistency of the data are still evident, it is anticipated the COC concentrations at OSW-8 will attenuate over time.

The data collected from the Phase III wells (OSW-7 and OSW-8), coupled with the known presence of historical industrial supply wells at Harris Industries indicates that OSW-8 likely represents the approximate midpoint and downgradient leading edge of the Chemsol plume, with Site COCs carbon tetrachloride and trichloroethene reported at low, typically single digit, concentrations. OSW-7 shows no evidence of the site COCs with all results below applicable GWQS except for 1,4-dioxane, which may or may not be related to the Chemsol Site.

Based on the collective analytical results obtained to date, the following off-site wells and sampling ports are recommended for sampling in February 2019, with a focus on sampling ports with detectable concentrations of site COCs and the collection of additional data at all sampling ports at OSW-7 and OSW-8. The recommend sampling program for February 2019 includes the following:

OSW-1: Port P5

OSW-2: Ports P1 through P6

OSW-3: Ports P1 through P6

OSW-4: Ports P3 and P4

OSW-5: Ports Port P1 through P6

OSW-6: None

OSW-7: Ports P1 through P7

OSW-8: Ports P1 through P7

Table 1
Summary of Field Parameters
OSW-1, OSW-2, OSW-3, OSW-4, OSW-5, OSW-6, OSW-7 and OSW-8
August 13-15, 2018

Sample Location	Sample Date	Dissolved Oxygen	pH	REDOX potential	Specific Conductivity	Temperature	Turbidity
OSW-1 P1	8/13/2018	12.96	8	118	0.283	18.8	1
OSW-1 P2	8/13/2018	1.53	7.98	123	0.246	19	0
OSW-1 P3	8/13/2018	0.8	7.95	127	0.246	17.85	4.3
OSW-1 P4	8/13/2018	10.88	7.84	91	0.379	17.4	0
OSW-1 P5	8/13/2018	2.54	7.56	-27	2.13	18.04	0
OSW-2 P1	8/13/2018	0.74	7.77	-39	0.681	19.13	0
OSW-2 P2	8/13/2018	0.26	7.89	-60	0.395	18.88	0.7
OSW-2 P3	8/13/2018	0.57	8.01	-76	0.258	19.54	0
OSW-2 P4	8/13/2018	0.9	8.01	-78	0.259	19.68	0
OSW-2 P5	8/13/2018	1.04	8.01	-69	0.311	19.19	0.3
OSW-2 P6	8/13/2018	1.03	7.9	-75	0.756	19.87	0
OSW-3 P1	8/13/2018	1.07	7.45	-32	0.443	20.31	1.5
OSW-3 P2	8/13/2018	1.39	7.87	-6	0.273	20.51	0.9
OSW-3 P3	8/13/2018	0.62	7.95	-4	0.274	21.05	1
OSW-3 P4	8/13/2018	9.92	8.02	-23	0.303	20.24	2
OSW-3 P5	8/13/2018	1.18	7.96	-30	0.313	21.58	1.3
OSW-3 P6	8/13/2018	1.69	7.92	-17	0.554	20.47	1
OSW-4 P1	8/14/2018	2.01	7.87	-57	0.366	23.45	4
OSW-4 P2	8/14/2018	1.77	7.89	-19	0.354	21.31	5.3
OSW-4 P3	8/14/2018	1.3	7.83	15	0.312	21.68	1.8
OSW-4 P4	8/14/2018	0.61	7.75	-15	0.303	21.45	5.4
OSW-4 P5	8/14/2018	9.34	7.76	-1	0.314	20.42	5.8
OSW-5 P1	8/14/2018	2.17	7.95	-13	0.321	22.43	0
OSW-5 P2	8/14/2018	1.85	7.93	-2	0.402	21.4	0
OSW-5 P3	8/14/2018	1.47	8.06	-22	0.263	20.16	0
OSW-5 P4	8/14/2018	1.46	7.86	-34	0.253	20.08	0
OSW-5 P5	8/14/2018	8.85	7.58	-54	0.445	21.57	1.1
OSW-5 P6	8/14/2018	1.28	7.55	-49	0.577	20.17	1.9
OSW-6 P1	8/14/2018	1.66	7.31	10	0.675	20.6	0.4
OSW-6 P2	8/14/2018	0.86	8.02	-54	0.310	20.16	0.4
OSW-6 P3	8/14/2018	1.35	8.08	-72	0.266	19.83	1.9
OSW-6 P4	8/14/2018	1.21	8.09	-75	0.342	21.02	5.1
OSW-6 P5	8/14/2018	9.86	8	-68	0.421	19.98	0
OSW-7 P1	8/15/2018	2.57	8.08	-24	.323	18.9	0.2
OSW-7 P2	8/15/2018	3.18	8.18	-27	.251	18.56	1.3
OSW-7 P3	8/15/2018	2.91	8.31	-30	.248	18.81	1.1
OSW-7 P4	8/15/2018	9.6	8.33	-64	.286	19.4	0.7
OSW-7 P5	8/15/2018	1.51	8.14	-70	.389	18.84	0.1
OSW-7 P6	8/15/2018	1.6	7.9	-81	1.07	18.86	0
OSW-7 P7	8/15/2018	1.41	7.8	-78	1.96	19.9	2.2
OSW-8 P1	8/15/2018	4.02	7.86	-98	.158	18.08	0.6
OSW-8 P2	8/15/2018	1.86	7.71	-74	.229	16.99	0
OSW-8 P3	8/15/2018	1.27	7.67	-68	.242	16.86	0
OSW-8 P4	8/15/2018	1.9	7.58	-71	.221	16.60	0
OSW-8 P5	8/15/2018	1.47	7.28	-56	.386	16.81	0.9
OSW-8 P6	8/15/2018	0.85	7.52	-74	.258	16.69	5.4
OSW-8 P7	8/15/2018	4.08	7.8	-72	.295	16.15	6.2

TABLE 2
FIELD PARAMETER DATA
OSW SERIES MONITORING WELLS

Sample Location	Sample Date	Dissolved Oxygen	pH	REDOX potential	Specific Conductivity	Temperature	Turbidity
OSW-1 P1	9/19/2011	11.81	8.33	107	0.433	16.35	21.1
	6/25/2012	2.52	7.4	160	0.328	20.93	0
	9/23/2013	14.16	7.39	157	0.394	19.25	0
	9/23/2013	14.16	7.39	157	0.394	19.25	0
	12/1/2017	NR	NR	NR	NR	NR	NR
	8/13/2018	12.96	8	118	0.283	18.8	1
OSW-1 P2	9/19/2011	11.29	8.13	120	0.384	16.31	41.2
	6/25/2012	1.92	7.41	108	0.32	18.47	0
	9/23/2013	7.28	7.69	165	0.408	16.23	0
	12/1/2017	NR	NR	NR	NR	NR	NR
	8/13/2018	1.53	7.98	123	0.246	19	0
OSW-1 P3	9/19/2011	11.93	8.06	127	0.365	15.53	38.5
	6/25/2012	2.03	7.59	36	0.33	19.77	0
	9/23/2013	6.87	7.7	161	0.398	15.24	0
	12/1/2017	NR	NR	NR	NR	NR	NR
	8/13/2018	0.8	7.95	127	0.246	17.85	4.3
OSW-1 P4	9/19/2011	2.61	7.64	101	0.313	19.56	11.5
	6/25/2012	2.55	7.55	-139	0.405	18.82	0
	9/23/2013	3.93	7.74	-53	0.511	15.16	0
	12/1/2017	NR	NR	NR	NR	NR	NR
	8/13/2018	10.88	7.84	91	0.379	17.4	0
OSW-1 P5	9/19/2011	1.37	7.15	131	1.64	18.75	0
	6/25/2012	1.16	7.5	-151	1.86	18.13	0
	9/23/2013	3.88	7.47	26	2.31	15.12	0.9
	12/1/2017	NR	NR	NR	NR	NR	NR
	8/13/2018	2.54	7.56	-27	2.13	18.04	0
OSW-2 P1	9/20/2011	2.45	7.96	67	0.436	18.67	0.3
	2/14/2012	3.73	7.41	50	0.618	12.71	12.8
	6/26/2012	3.51	7.57	-55	0.584	20.09	0
	9/23/2013	5.21	7.17	-174	0.758	15.76	2.3
	12/5/2013	4.41	7.82	-160	0.779	14.44	0
	4/28/2014	3.19	7.18	-2	0.774	13.73	0
	7/7/2014	7.27	7.73	-80	0.66	19.35	73.3
	10/14/2014	5.88	8.82	-101	0.748	18.57	0.8
	11/16/2017	0	7.63	-147	0.586	16.51	1.6
	8/13/2018	0.74	7.77	-39	0.681	19.13	0
OSW-2 P2	9/20/2011	2.27	7.77	84	0.485	16.95	0
	2/14/2012	2.98	6.96	46	0.5	12.02	6.2
	6/26/2012	3.11	7.34	-102	0.414	20.05	0
	9/23/2013	3.6	7.46	-170	0.491	15.53	2.6
	12/5/2013	3.06	8.21	-169	0.535	14.36	0
	4/28/2014	3.56	7.19	-67	0.543	12.92	0
	7/7/2014	7.33	7.74	-36	0.202	20.68	117
	10/14/2014	14.07	8.34	-88	0.471	17.54	0
	11/16/2017	0	7.72	-178	0.398	16.24	0.7
	8/13/2018	0.26	7.89	-60	0.395	18.88	0.7
OSW-2 P3	9/20/2011	8.84	7.59	86	0.592	16.52	0
	2/14/2012	9.93	6.67	34	0.403	11.87	7.9
	6/26/2012	3.96	6.96	-84	0.355	18.91	0
	9/23/2013	3.57	7.01	-148	0.403	15.43	0.4
	12/5/2013	3.03	8.4	-174	0.394	14.51	0
	4/28/2014	3.74	7.49	-79	0.391	12.96	0
	7/7/2014	8.45	8.09	-83	0.11	17.96	87.1
	10/14/2014	13.2	7.85	-57	0.362	16.27	0
	11/16/2017	0	7.88	-122	0.383	16.15	1.4
	8/13/2018	0.57	8.01	-76	0.258	19.54	0
OSW-2 P4	9/20/2011	0.93	7.68	87	0.402	17.1	0.9
	2/14/2012	2.05	6.85	17	0.394	11.92	12.3
	6/26/2012	3.94	6.84	-65	0.359	18.93	0
	9/23/2013	3.32	6.96	-136	0.392	15.43	2.7
	12/5/2013	2.88	8.15	-148	0.396	14.56	0
	4/28/2014	3.94	7.32	-57	0.403	13.24	0
	7/7/2014	8.58	8.11	-6	0.355	17.34	100
	10/14/2014	11.69	7.8	-48	0.37	16.13	0
	11/16/2017	0	7.85	-108	0.284	15.88	2.1
	8/13/2018	0.9	8.01	-78	0.259	19.68	0
OSW-2 P5	9/20/2011	0.85	7.81	96	0.399	16.59	0
	2/14/2012	1.81	7.09	1	0.403	12.37	14.4
	6/26/2012	4.04	8.04	-6	0.345	18.74	0
	9/23/2013	2.97	7.43	-138	0.418	15.31	0.1
	12/5/2013	2.31	8.13	-153	0.424	14.56	0
	4/28/2014	3.45	7.49	-52	0.437	13.06	0
	7/7/2014	7.48	7.79	-60	0.211	20.1	38.7
	10/14/2014	12.12	8.11	-72	0.396	16.37	0
	11/16/2017	0	N/A	-83	0.533	15.98	0.7
	8/13/2018	1.04	8.01	-69	0.311	19.19	0.3
OSW-2 P6	9/20/2011	0.74	7.39	85	0.947	16.4	0
	2/14/2012	2.58	7.18	6	1.05	11.41	14.5
	6/26/2012	3.62	7.9	-38	0.806	18.47	0
	9/23/2013	2.73	7.2	-119	1.1	15.26	0.2
	12/5/2013	2.08	7.88	-141	1.05	14.48	0
	4/28/2014	3.81	7.23	-22	1.09	13.01	0
	7/7/2014	8.77	7.9	-36	0.97	19030	45.8
	10/14/2014	12.29	7.93	-53	0.98	15.92	0
	11/16/2017	0	7.73	-53	0.485	16.07	0.1
	8/13/2018	1.03	7.9	-75	0.766	19.87	0

TABLE 2
FIELD PARAMETER DATA
OSW SERIES MONITORING WELLS

Sample Location	Sample Date	Dissolved Oxygen	pH	REDOX potential	Specific Conductivity	Temperature	Turbidity
OSW-3 P1	9/21/2011	2.57	7.6	67	0.523	16.52	0
	11/8/2011	2.47	7.92	133	0.513	17.34	7.6
	2/14/2012	9.47	7.33	-15	0.598	18.32	3.3
	6/26/2012	4.64	7.69	-182	0.485	21.8	0
	9/24/2013	4.16	7.17	-191	0.594	21.3	0
	12/5/2013	2.42	7.83	-198	0.63	14.94	0
	4/28/2014	4.09	6.81	13	0.613	19.5	0
	7/8/2014	9.44	7.65	-22	0.494	24.36	0
	10/14/2014	14.83	8.14	-58	0.549	15.93	0
	11/16/2017	1.62	7.16	1	0.493	16.48	0
	8/13/2018	1.07	7.45	-32	0.443	20.31	1.5
	9/21/2011	2.39	8.03	40	0.368	17.2	0
OSW-3 P2	11/8/2011	3.47	8.04	119	0.367	17.56	11.4
	2/14/2012	13.69	7.09	160	0.377	18.45	0.9
	6/26/2012	3.49	7.6	-156	0.346	21.05	0
	9/24/2013	4.05	6.95	17	0.433	18.03	0
	12/5/2013	3.29	8.04	-115	0.429	15.24	0
	4/28/2014	4.3	7.23	6	0.405	13.2	0
	7/8/2014	11.46	7.95	47	0.367	17.51	0
	10/14/2014	14.62	7.95	-17	0.362	16.35	0
	11/16/2017	3.62	7.63	112	0.3	16.23	0
	8/13/2018	1.39	7.87	-6	0.273	20.51	0.9
	9/21/2011	0.9	7.83	75	0.373	17.12	0
	11/8/2011	2.04	8.12	111	0.374	17.63	8.6
OSW-3 P3	2/14/2012	12.77	7.48	96	0.379	18.45	0.1
	6/26/2012	3.3	7.64	-119	0.315	20	0.1
	9/24/2013	3.91	6.83	109	0.424	18.66	0
	12/5/2013	2.62	8.07	1	0.393	15.19	0
	4/28/2014	3.27	7.1	42	0.41	13.19	0
	7/8/2014	10.02	7.94	68	0.363	17.97	0
	10/14/2014	15.06	8.07	-22	0.357	15.01	0
	11/16/2017	0	7.74	130	0.294	15.73	0
	8/13/2018	0.62	7.95	-4	0.274	21.05	1
	9/21/2011	0.96	7.75	77	0.368	17.2	0
	11/8/2011	2.44	8.19	107	0.356	17.64	9.1
OSW-3 P4	2/14/2012	11.06	7.59	89	0.367	18.92	0.4
	6/26/2012	2.5	7.84	-153	0.31	18.95	0
	9/24/2013	3.71	6.81	140	0.412	18.79	0
	12/5/2013	3.02	8.11	53	0.38	15.1	0
	4/28/2014	3.9	7.44	16	0.376	12.91	0
	7/8/2014	10.45	8.01	80	0.351	16.67	0
	10/14/2014	14.56	7.95	-6	0.349	15.07	0
	11/16/2017	0	7.74	140	0.281	15.52	0.2
	8/13/2018	9.92	8.02	-23	0.303	20.24	2
	9/21/2011	0.86	7.63	86	0.398	16.84	0
	11/8/2011	2.02	8.14	108	0.4	18.06	7.2
OSW-3 P5	2/14/2012	12.63	7.63	-17	0.41	18.3	2
	6/26/2012	1.37	7.92	-156	0.364	21.37	0
	9/24/2013	3.26	5.51	198	0.523	19.63	0
	12/5/2013	1.83	8.09	34	0.446	15.13	0
	4/28/2014	3.01	7.12	17	0.438	13.53	0
	7/8/2014	9.65	8.2	86	0.385	16.54	0
	10/14/2014	13.62	7.91	6	0.382	15.08	0
	11/16/2017	0	7.77	-9	0.315	15.44	0.1
	8/13/2018	1.18	7.96	-30	0.313	21.58	1.3
	9/21/2011	0.4	7.72	63	0.403	16.78	0
	11/8/2011	2.9	8.08	99	0.416	18.09	7.5
OSW-3 P6	2/14/2012	9.75	7.75	-64	0.412	18.33	2.2
	6/26/2012	1.64	7.91	-210	0.364	18.89	0
	9/24/2013	3.5	7.25	-66	0.436	18.06	0
	12/5/2013	1.87	8.1	-63	0.431	15.19	0
	4/28/2014	3.29	7.04	24	0.434	13.8	0
	7/8/2014	8.65	8.06	-17	0.397	17.21	0
	10/14/2014	12.54	7.74	14	0.393	15.38	0
	11/16/2017	0	7.83	-95	0.337	15.28	0.5
	8/13/2018	1.69	7.92	-17	0.554	20.47	1
	9/21/2011	1.58	7.67	101	0.426	16.87	0
	11/7/2011	3.45	7.48	148	0.444	14.77	10.2
OSW-4 P1	6/25/2012	2.3	7.54	-121	0.4	20.93	0
	8/14/2018	2.01	7.87	-57	0.366	23.45	4
	9/21/2011	2.37	7.41	115	0.467	16.51	0
	11/7/2011	3.05	7.1	158	0.444	15.16	9.7
	6/25/2012	2.18	7.51	-67	0.427	21.04	0
OSW-4 P2	9/24/2013	8.02	6.9	115	0.521	19.24	0.2
	8/14/2018	1.77	7.89	-19	0.354	21.31	5.3
	9/21/2011	5.44	7.45	87	0.485	16.48	0
	11/7/2011	1.6	6.93	166	0.427	15.25	8.8
	6/25/2012	0.9	7.82	-155	0.356	19.04	0
OSW-4 P3	9/24/2013	4.71	7.36	12	0.416	16.85	0
	8/14/2018	1.3	7.83	15	0.312	21.68	1.8
	9/21/2011	0.52	7.18	62	0.432	16.66	0
	11/7/2011	1.37	6.99	125	0.409	16.2	8.8
	6/25/2012	1.46	7.93	-149	0.347	21.07	0
OSW-4 P4	9/24/2013	3.49	7.18	74	0.413	18.66	0.9
	8/14/2018	0.61	7.75	-15	0.303	21.45	5.4
	9/21/2011	0.64	7.07	60	0.455	15.97	0
	11/7/2011	1.55	7.12	137	0.424	16.24	6.4
	6/25/2012	2.03	7.77	-147	0.369	20.05	0
OSW-4 P5	9/24/2013	4.33	7.64	90	0.418	16.95	0
	8/14/2018	9.34	7.76	-1	0.314	20.42	5.8
	9/21/2011	0.55	7.15	125	0.425	16.71	0

TABLE 2
FIELD PARAMETER DATA
OSW SERIES MONITORING WELLS

Sample Location	Sample Date	Dissolved Oxygen	pH	REDOX potential	Specific Conductivity	Temperature	Turbidity
OSW-5 P1	9/25/2013	5.48	7.82	22	0.487	17.84	0
	12/6/2013	1.91	8.1	-161	0.47	12.98	0
	4/29/2014	5.29	7.58	112	0.502	10.69	0
	7/7/2014	7.85	8.07	58	0.375	19.78	50.3
	10/15/2014	9.55	9.12	-101	0.428	15.92	0
	11/17/2017	0	7.59	-78	0.382	13.49	0
	8/14/2018	2.17	7.95	-13	0.321	22.43	0
OSW-5 P2	9/25/2013	3.23	7.36	-94	0.562	17.28	0
	12/6/2013	1.76	7.85	-163	0.525	13.08	0
	4/29/2014	4.39	7.53	2	0.51	10.78	0
	7/7/2014	7.43	7.97	-56	0.48	20.79	79.8
	10/15/2014	10.76	8.93	-119	0.507	15.14	0
	11/17/2017	0	7.55	-24	0.499	14.1	0
	8/14/2018	1.85	7.93	-2	0.402	21.4	0
OSW-5 P3	9/25/2013	2.84	6.39	16	0.513	17.93	0
	12/6/2013	1.63	7.83	-169	0.45	13.33	0
	4/29/2014	4.37	7.23	-23	0.43	10.37	0
	7/7/2014	6.29	8.1	-142	0.335	22.01	99.1
	10/15/2014	11.28	8.65	-100	0.365	14.99	0
	11/17/2017	0	7.9	-69	0.288	14.34	0
	8/14/2018	1.47	8.06	-22	0.263	20.16	0
OSW-5 P4	9/25/2013	2.65	7.69	-119	0.42	16.85	0
	12/6/2013	3.65	7.88	-167	0.406	13.26	0
	4/29/2014	4.45	7.37	-35	0.411	10.16	0
	7/7/2014	6.87	8.08	-89	0.342	21.37	88.5
	10/15/2014	11.62	8.62	-87	0.35	14.8	0
	11/17/2017	0	7.85	23	0.282	14.63	0
	8/14/2018	1.46	7.86	-34	0.253	20.08	0
OSW-5 P5	9/25/2013	2.86	7.9	-135	0.592	16.59	0
	12/6/2013	1.42	7.82	-168	0.606	13.07	0
	4/29/2014	4.16	7.01	-63	0.629	10.23	0
	7/7/2014	6.15	8.14	-131	0.487	21.66	85.8
	10/15/2014	11.88	8.38	-68	0.55	15.3	0
	11/17/2017	0	7.6	-121	0.461	14.68	0
	8/14/2018	8.85	7.58	-54	0.445	21.57	1.1
OSW-5 P6	9/25/2013	2.33	7.35	-145	0.804	16.9	0
	12/6/2013	2.26	7.66	-174	0.785	13.46	0
	4/29/2014	4.33	6.44	-39	0.895	10.3	0
	7/7/2014	6.77	7.96	-168	0.669	20.84	81.9
	10/15/2014	11.22	8.14	-79	0.738	14.82	0
	11/17/2017	0	7.6	-73	0.634	14.64	0
	8/14/2018	1.28	7.55	-49	0.577	20.17	1.9
OSW-6 P1	9/25/2013	4.82	7.26	199	0.916	18.69	0
	12/6/2013	3.14	8.02	-130	0.92	13.15	0
	4/29/2014	4	6.81	9	0.929	10.29	0
	7/8/2014	10.6	7.57	76	0.84	17.39	0
	10/15/2014	12.95	8.51	-70	0.804	15.15	0
	11/16/2017	0	6.96	91	0.752	14.87	0
	8/14/2018	1.66	7.31	10	0.675	20.6	0.4
OSW-6 P2	9/25/2013	4.51	7.73	-78	0.57	16.99	0.9
	12/6/2013	2.82	8.1	-134	0.536	13.03	0
	4/29/2014	3.5	7.34	-43	0.473	10.11	0
	7/8/2014	9.23	7.82	74	0.418	16.7	0
	10/15/2014	12.84	8.86	-93	0.4	14.99	0
	11/16/2017	0	7.66	9	0.312	15.08	4
	8/14/2018	0.86	8.02	-54	0.31	20.16	0.4
OSW-6 P3	9/25/2013	3.86	7.85	-36	0.465	16.62	0
	12/6/2013	2.45	8.08	-133	0.443	12.84	0
	4/29/2014	6.24	7.42	-53	0.427	10.19	0
	7/8/2014	9	7.42	77	0.375	17.15	0
	10/15/2014	11.52	8.87	-85	0.362	16.77	0
	11/16/2017	0	7.77	67	0.287	15.14	0
	8/14/2018	1.35	8.08	-72	0.266	19.83	1.9
OSW-6 P4	9/25/2013	5.3	8.16	-175	0.528	18.95	0
	12/6/2013	3.12	8.01	-179	0.521	12.52	0
	4/29/2014	4.09	7.69	-61	0.544	10.04	0
	7/8/2014	8.47	7.99	-148	0.479	16.58	0
	10/15/2014	10.92	8.57	-91	0.476	15.34	0
	11/16/2017	0	7.74	-67	0.391	15.05	0
	8/14/2018	1.21	8.09	-75	0.342	21.02	5.1
OSW-6 P5	9/25/2013	2.55	7.26	-163	0.618	18.04	0
	12/6/2013	2.05	7.99	-197	0.585	13.14	0
	4/29/2014	3.75	7.66	-83	0.591	10.16	0
	7/8/2014	8.4	7.98	-167	0.56	16.76	0
	10/15/2014	10.88	8.39	-90	0.549	14.81	0
	11/16/2017	0	7.72	-103	0.458	15.07	0
	8/14/2018	9.86	8	-68	0.421	19.98	0

TABLE 2
FIELD PARAMETER DATA
OSW SERIES MONITORING WELLS

Sample Location	Sample Date	Dissolved Oxygen	pH	REDOX potential	Specific Conductivity	Temperature	Turbidity
OSW-7 P1	5/15/2017	2.81	7.75	284	0.343	15.94	0.3
	8/7/2017	2.11	8.2	-17	0.381	16.13	0
	11/17/2017	2.13	7.81	92	0.363	14.88	0
	8/15/2018	2.57	8.08	-24	.323	18.9	0.2
OSW-7 P2	5/15/2017	1.03	7.59	291	0.272	15.58	5.0
	8/7/2017	0.16	7.97	-43	0.285	16.18	0.0
	11/17/2017	7.88	7.83	-26	0.275	14.92	0.0
	8/15/2018	3.18	8.18	-27	.251	18.56	1.3
OSW-7 P3	5/15/2017	2.48	7.72	104	0.277	15.30	5.1
	8/7/2017	0.43	7.95	-63	0.285	16.05	0
	11/17/2017	0	7.91	-115	0.271	15.02	0
	8/15/2018	2.91	8.31	-30	.248	18.81	1.1
OSW-7 P4	5/15/2017	0.32	7.47	20	0.353	15.25	3.0
	8/7/2017	0	7.9	-77	0.336	15.82	0.0
	11/17/2017	0	7.82	-139	0.318	15.06	0.0
	8/15/2018	9.6	8.33	-64	.286	19.4	0.7
OSW-7 P5	5/15/2017	0.41	7.42	-10	0.413	15.15	1.2
	8/7/2017	0	7.79	-112	0.431	15.76	0
	11/17/2017	0	7.72	-153	0.417	15.04	0
	8/15/2018	1.51	8.14	-70	.389	18.84	0.1
OSW-7 P6	5/15/2017	0.4	7.21	-23	0.731	15.01	3.0
	8/7/2017	0	7.56	-106	1.030	15.85	0.1
	11/17/2017	0	7.47	-163	1.100	14.99	0.0
	8/15/2018	1.6	7.9	-81	1.07	18.86	0.0
OSW-7 P7	5/15/2017	1.08	7.1	6	1.580	14.95	3.1
	8/7/2017	0	7.46	-73	1.98	15.56	0
	11/17/2017	0	7.34	-175	2.060	14.95	0
	8/15/2018	1.41	7.8	-78	1.96	19.9	2.2
OSW-8 P1	5/15/2017	4.45	7.71	290	0.183	12.91	7.1
	8/7/2017	2.86	8.04	46	0.204	15.01	1.1
	11/17/2017	2.44	7.85	113	0.199	12.26	1.3
	8/15/2018	4.02	7.86	-98	.158	18.08	0.6
OSW-8 P2	5/15/2017	1.73	7.61	294	0.254	12.90	0.5
	8/7/2017	0	7.87	12	0.270	13.04	0.4
	11/17/2017	7.27	7.87	72	0.262	12.24	0.7
	8/15/2018	1.86	7.71	-74	.229	16.99	0
OSW-8 P3	5/15/2017	2.56	7.76	255	0.281	12.50	3.1
	8/7/2017	0	7.91	-20	0.285	13.50	0.8
	11/17/2017	0	7.95	56	0.272	12.18	1.1
	8/15/2018	1.27	7.67	-68	.242	16.86	0
OSW-8 P4	5/15/2017	0.52	7.72	211	0.264	12.91	4.1
	8/7/2017	0	7.98	-52	0.264	13.66	0
	11/17/2017	6.42	7.99	-129	0.244	12.12	0.9
	8/15/2018	1.9	7.58	-71	.221	16.60	0
OSW-8 P5	5/15/2017	0.65	7.19	261	0.427	12.85	1.6
	8/7/2017	0	7.52	-29	0.463	13.21	0.5
	11/17/2017	0	7.41	-89	0.448	12.19	0
	8/15/2018	1.47	7.28	-56	.386	16.81	0.9
OSW-8 P6	5/15/2017	0.44	7.74	153	0.314	12.84	2.8
	8/7/2017	4.21	7.89	-64	0.298	13.20	1.5
	11/17/2017	6	7.92	-127	0.284	12.21	0
	8/15/2018	0.85	7.52	-74	.258	16.69	5.4
OSW-8 P7	5/15/2017	0.65	7.76	21	0.318	12.80	10
	8/7/2017	0	7.92	-85	0.337	13.11	1.4
	11/17/2017	0	7.93	-107	0.330	11.94	1.2
	8/15/2018	4.08	7.8	-72	.295	16.15	6.2

NR - parameter not recorded

TABLE 3
DETECTED VOCs IN OSW SERIES MONITORING WELLS
(All values ug/l)

Shaded values exceed New Jersey Groundwater Quality Standard

TABLE 3
DETECTED VOCs IN OSW SERIES MONITORING WELLS
 (All values ug/l)

Sample Location	Sample Date	Water bearing zone and depth below ground surface.	CIS-1,2-DI ETHYLENE	CHLORO CYCLO HEXANE	DIBROMO CHLORO METHANE	DICHLORO DIFLUORO XYLENES, TOTAL	DIMETHYL BENZENE/XYLENE, DIBROMIDE (2-BUTA NONE)	METHYL ETHYL KETONE	METHYL CYCLO HEXANE	METHYLENE CHLORIDE	TERT-BUTYL (PCE)	TETRA CHLORO ETHYLENE	TRANS-1,2-DICHLORO ETHENE	CHLORO FLUORO (TCE)	TRI CHLORO METHANE	TRI CHLORO FREON TF	VINYL CHLORIDE	TVO (w/o 1,4 Dioxane and Acetone)*
NJGWQS			70	1	1000	1000	0.03	300	3	70	1	600	100	1	2000	20000	1	
OSW-1 P1	9/19/2011											0.41	0.23				1.74	1.74
	6/25/2012	Upper										0.25	0.2				84.75	0.75
	9/23/2013	Permeable					0.36					0.25	0.24	0.25			1.37	1.37
	12/11/2017	233 - 243							3.3		0.75		2.3				167.53	8.53
	8/13/2018													0.95			4.09	4.09
OSW-1 P2	9/19/2011											0.57	0.29				1.99	1.99
	6/25/2012	Principal										0.32					96.54	0.54
	9/23/2013	290 - 300											0.2	0.28			0.74	0.74
	12/11/2017											0.83	1.3				102.6	3.60
	8/13/2018																0.25	0.00
OSW-1 P3	9/19/2011											0.36	0.27				2.07	2.07
	6/25/2012	Principal										0.45	0.22				127.17	1.17
	9/23/2013	350 - 360					0.31						0.15	0.27			30.97	0.97
	12/11/2017											0.57	0.58				130.74	1.44
OSW-1 P4	9/19/2011		0.18						1.6			30	0.37				69.28	58.28
	6/25/2012	Principal										1.3					88.91	1.91
	9/23/2013	400 - 410												0.19			29.32	0.32
	12/11/2017											0.73					119.929	0.83
OSW-1 P5	9/19/2011	0.95										4	7.5				31.81	31.81
	6/25/2012	1.3										0.69	11				103.43	35.43
	9/23/2013	Lower Bedrock	0.93									0.73	0.16	8.6			38.88	27.88
	12/11/2017	520 - 530	0.89									0.57	0.46	5.5			90.8	9.80
	8/13/2018	1.3										1.6		10			30.692	29.71
OSW-2 P1	9/20/2011	46							2.2	0.21	1.8	1	0.17	150		2.9	432.44	424.04
	9/20/2011	46							2.3	0.2	1.9	1	0.19	150		2.9	432.507	425.21
	2/14/2012	0.68						11		0.25			0.62		0.86		1185.41	15.41
	6/26/2012	0.71										0.2	0.73			0.21	116.64	2.64
	9/23/2013	Upper	4.7						3.7			0.68	1.4				91.26	11.26
	12/5/2013	Permeable	4.6									0.49	1.5				179.99	10.99
	4/28/2014	70 - 80	1.9									0.23	0.64			0.19	135.11	3.11
	7/7/2014	3.4										0.27	1.4				51.52	6.52
	10/14/2014	6.9											2				237.94	9.94
	11/16/2017	4.9						0.22 J			0.36 J	1.9				2.6	143.74	11.24
	8/13/2018	4.2						0.41				1.6				2.30	179.70	9.70
OSW-2 P2	9/20/2011	30						0.81		1	1.2	0.21	56		6.6	206.94	195.94	
	2/14/2012	20					6.1	0.5		0.74	1.2		45		4.6	963.93	153.93	
	6/26/2012	15							0.55	0.87	0.21		38		3.3	290.092	118.09	
	9/23/2013	Upper	13					0.69	0.4	0.58			27			111.97	77.97	
	12/5/2013	Permeable	12					0.49	0.4	0.55			29			192.12	76.12	
	4/28/2014	13						0.35		0.44	0.46		27		1.1	159.88	76.58	
	7/7/2014	10							0.42	0.36	0.15		29		1.3	98.84	72.84	
	10/14/2014	12								0.45			27		1.3	143.58	67.58	
	11/16/2017	9.6						0.27 J		0.24 J	1.7		10		4.7	190.45	40.45	
	8/13/2018	8.7						0.26		0.85			16		3.1	463.629	356.43	
OSW-2 P3	9/20/2011	1.3							1.2		0.73		1.6			17.02	7.12	
	2/14/2012	16						2		1.5	0.32		120		1.4	618.867	348.87	
	6/26/2012	17						3		0.77	0.77		100		1.6	547.881	536.88	
	9/23/2013	28					2.7		0.89	0.85	0.13		120		2	436.98	365.98	
	12/5/2013	Principal	28					3.6							1.7	495.49	401.49	
	4/28/2014	250 - 260	23					2.1		1.1	0.59		140		1.5	521.273	464.57	
	7/7/2014	17						1.6		1	0.81	0.16	130		2.2	420.782	395.78	
	10/14/2014	22						1.7		0.99	1.1		120		2.2	464.54	397.54	
	11/16/2017	25						1.6		0.82 J	1.1		100		2.2	392.753	339.75	
	8/13/2018	40					0.67		3.4	0.63	1.6		90		3.1	463.629	356.43	
OSW-2 P4	9/20/2011	32						1.2		1.3	4.1		120		2.7	470.535	424.54	
	2/14/2012	23						1		1.4	1.1		140		2.2	599.674	4	

TABLE 3
DETECTED VOCs IN OSW SERIES MONITORING WELLS
(All values ug/l)

TABLE 3
DETECTED VOCs IN OSW SERIES MONITORING WELLS
(All values ug/l)

Sample Location	Sample Date	Water bearing zone and depth below ground surface.				DIMETHYL BENZENE/XYLEMES, ETHYLENE				METHYL ETHYL KETONE			TERT-BUTYL CHLORO ETHYLENE		TRANS-1,2-DICHLORO ETHYLENE		TRI-CHLORO FLUORO METHANE		TRI-CHLORO FLUORO VINYL FREON TF CHLORIDE		TVO* TVO (w/o 1,4 Dioxane and Acetone)*	
		CIS-1,2-DI CHLORO ETHYLENE	CYCLO HEXANE	DIBROMO CHLORO METHANE	DICHLORO DIIFLUORO METHANE	TOTAL	ETHYLENE DIBROMIDE NONE)	METHYL CHLORIDE	ETHER	CHLORO (PCE)	TOLUENE	ETHENE	(TCE)	1000	2000	20000	1					
NJGWQS		70	1	1000	1000	0.03	300	3	70	1	600	100	1	2000	20000	1		233.61	3.61			
OSW-3 P1	11/8/2011						1.4		0.52		1.3		0.23									
	2/14/2012								0.25		0.58		0.38							3.91	1.21	
	6/26/2012		0.27						0.3		0.83		0.32							165.819	1.82	
	9/24/2013	Upper	0.49				3.4				0.46		0.24							10.29	4.59	
	12/5/2013	Permeable	1.1								1.2		0.42						1.1	46.83	7.83	
	4/28/2014		0.34								0.43									88.31	1.31	
	7/8/2014		70 - 80		0.2				0.14		0.34		0.16							7.54	0.84	
	10/14/2014			0.18															4.44	0.64		
	11/16/2017							0.23 J			0.33 J								2.96	0.56		
	8/13/2018																		2.6	0.00		
OSW-3 P2	11/8/2011		0.53								0.83		0.86							26.61	2.61	
	2/14/2012		0.39								0.56		0.81							6.42	2.12	
	6/26/2012		0.4								0.81		0.49							136.83	1.83	
	9/24/2013	Upper									0.24		0.31							29.55	0.55	
	12/5/2013	Permeable	0.25								0.18		0.25							4.23	0.43	
	4/28/2014		130 - 140		0.25								0.19							4.12	1.02	
	7/8/2014												0.25							4.19	0.19	
	10/14/2014																		4.15	0.25		
	11/16/2017		0.26 JF1					0.13 JF1			0.29 J		0.18 JF1							5.06	0.86	
	8/13/2018																		4.5	0.00		
OSW-3 P3	11/8/2011	79					0.27		1.5		2.8		0.39	24					234.06	214.96		
	2/14/2012	59						1.3		1.9		0.35	20						158.35	154.15		
	6/26/2012	65						1.1		2.2		0.39	21						324.58	178.58		
	9/24/2013	56						1.5		0.4		0.31	18						174.65	157.65		
	12/5/2013	Principal	49					1.5		0.17		0.31	20						146.56	142.26		
	4/28/2014	200 - 210	46					1.3		0.31		0.22	15						138.82	136.22		
	7/8/2014	46						1.4		0.32		17						0.16	135.39	131.89		
	10/14/2014	40						1.5		0.27		16							121.11	117.41		
	11/16/2017							1.1		0.18 J		12							61.76	59.06		
	8/13/2018	27							0.98			11							84.25	81.65		
OSW-3 P4	11/8/2011	15						0.55		0.26		10							68.35	61.55		
	2/14/2012	11						0.31		0.16		6.2							36.8	36.80		
	6/26/2012	9.6						0.27		0.74		6.2							198.745	40.75		
	9/24/2013	11							0.58			7.9							53.74	45.74		
	12/5/2013	Principal	9.8						0.49			7.5							44.44	42.54		
	4/28/2014	264 - 274	11									7.7							51.14	51.14		
	7/8/2014	8.9							0.43			6.4							40.91	38.71		
	10/14/2014	9.1							0.55			6.8							39.28	37.78		
	11/16/2017	5.6							0.34 J			4.5							26.27	25.51		
	8/13/2016	5.4							0.38			4.3							24.84	23.98		
OSW-3 P5	11/8/2011	17					0.25		5		0.8		78						262.33	256.93		
	2/14/2012	12						2.7		0.63		49							148.63	146.03		
	6/26/2012	12						2.2		0.76		51							358.04	178.04		
	9/24/2013	8.5						1.9		0.24		49							152.106	149.31		
	12/5/2013	Principal	4.2						0.61		0.35		20						67.33	65.33		
	4/28/2014	350 - 360	15					0.33	0.27	22		0.18		47					0.3	181.831	181.83	
	7/8/2014	17						0.3	29			38							0.28	149.807	148.01	
	10/14/2014	23							0.32	51		0.15		42					0.31	184.901	183.20	
	11/16/2017	11								12		0.42 J		25						93.88	91.88	
	8/13/2018	19							29			23							109.56	105.56		
OSW-3 P6	11/8/2011	0.33								2		0.54							6.77	4.07		
	2/14/2012	0.38								0.7		0.68							2.74	1.76		
	6/26/2012	0.38					3.1				0.83		0.46						171.85	4.85		
	9/24/2013										0.35		0.28						2.73	0.63		
	12/5/2013	Lower Bedrock									0.43								0.43	0.43		
	4/28/2014	410 - 420																	0.63	0.63		
	7/8/2014										0.19		0.17						0.47	0.47		
	10/14/2014	0.28																	0.81	0.81		
	11/16/2017																		1.6	0.00		
	8/13/2018																		1.1	0.00		
OSW-4 P1	11/7/2011									0.53									15.39	3.49		
	6/25/2012	Upper								1.1									116.28	2.28		
	9/24/2013	Permeable								1									90.44	2.44		
	8/14/2018																		8.72	0.42		
OSW-4 P2	11/7/2011									1		0.25							12.18	2.18		
	6/25/2012	Principal	0.22							0.21									53.74	0.74		
	9/24/2013	146 - 156	0.2							0.23		0.3							9.77	0.97		
	8/14/2018																	13	0.00			
OSW-4 P3	11/7/2011	1.2								2.3		0.83							14.11	14.11		
	6/25/2012	Principal	0.9							0.8		0.67							56.258	9.26		
	9/24/2013	210 - 220	1.3							0.39		1.1							17.19	10.59		
	8/14/2018	1.5								0.41		0.91							18.82	7.92		
OSW-																						

TABLE 3
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(All values ug/l)

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(All values ug/l)

Sample Location	Sample Date	Water bearing zone and depth below ground surface.		CIS-1,2-DI CHLORO ETHYLENE	DIBROMO CYCLO HEXANE	DICHLORO DIFLUORO METHANE	DIMETHYL BENZENE/ XYLENES, TOTAL	METHYL KETONE (2-BUTA CYCLO HEXANE	TERT-BUTYL METHYL METHYLENE CHLORIDE	TETRA CHLORO ETHYLENE (PCE)	TRI TRANS-1,2- DICHLORO ETHENE	TRI CHLORO FLUORO METHANE	VINYL FREON TF CHLORIDE	TVO*	TVO (w/o 1,4 Dioxane and Acetone)*			
		NJGWQS	70	1	1000	1000	0.03	300	3	70	1	600	100	1	2000	20000	1	
OSW-5 P1	9/25/2013	0.2							0.29			0.47			2.63	1.53		
	12/6/2013							5			2.9		0.34		592.76	12.76		
	4/29/2014	Upper	0.38							0.24		1.1		0.61		303	3.00	
	7/7/2014	Permeable	0.2								0.32		0.51		3.36	1.46		
	10/15/2014	90 - 100										0.31		10.19		0.49		
	11/17/2017		0.29 J							0.29 J		0.37 J			0.11 J	56.06	1.06	
	8/14/2018														1.411	0.01		
OSW-5 P2	9/25/2013	240				7.2			11	0.6	3	9.1	0.87	250	45	1024.957	997.96	
	12/6/2013	220	0.45		1			0.21	12		2.1	21	0.85	220	38	1085.517	848.52	
	4/29/2014	Upper	190	0.37		0.94		3.9	3.2	0.36	2.1	17	0.7	170	21	1030.694	620.69	
	7/7/2014	Permeable	190	0.34		0.64			4.3	0.47	2.4	11	0.71	190	40	717.726	690.33	
	10/15/2014	258 - 268	140	0.42		0.96		0.23	3.7	0.45	3	11	0.62	180	52	610.919	584.92	
	11/17/2017	110	0.79 J				0.022		2.4		1.7	0.74 J	0.53 J	150	24	490.682	467.68	
	8/14/2018	150	0.41					0.28	1.9		2.5	0.59	0.66	210	27	625.719	605.72	
OSW-5 P3	9/25/2013	20							2.4		0.69	4.3		86	2.9	296.409	291.81	
	12/6/2013	15					8.8		2.9		0.45	7.8		73	2.2	648.23	208.23	
	4/29/2014		25						3.8		1.6	2.1	0.22	230	1.6	629.19	622.89	
	7/7/2014	Principle	23						5		1.5	1.3		270	3	707.05	699.05	
	10/15/2014	314 - 324	23						4.9		1.7			270	1.6	681.58	675.78	
	11/17/2017	24	0.59 J				0.083		4.8		1.8	0.39 J	0.24 J	300	0.57 J	811.673	784.67	
	8/14/2018	25						2.9		2.3				300	3.2	896.14	880.14	
OSW-5 P4	9/25/2013	25						1.8		1	2.6		150		3.1	460.056	455.56	
	12/6/2013	22					12	4.8		0.85	5		150		2.5	783.844	443.84	
	4/29/2014		25					1.7		1.4	2.3	0.2	160		1.5	660.123	452.42	
	7/7/2014	Principle	21					1.2		1.5	0.85	0.16	160		1.9	427.588	420.09	
	10/15/2014	360 - 370	18						1.5					140		0.79	380.247	376.25
	11/17/2017	10				0.0058 J		0.24 J		0.81 J				92		241.858	235.69	
	8/14/2018	9							0.98					80		221.0426	218.24	
OSW-5 P5	9/25/2013	26						3.7		1.6	5.2		260		3.6	839.29	831.69	
	12/6/2013	21						4.3		1.1	13	0.17	200		2.7	1228.56	668.56	
	4/29/2014		25				7.1	5.3		1.5	7.5	0.22	220		2.3	1176.19	728.09	
	7/7/2014	Principal	29					3.9		2.1	3.4	0.28	300		3.9	903.02	895.12	
	10/15/2014	434 - 444	26						2.6		1.5	0.25		300		2.8	871.15	862.65
	11/17/2017	15	0.53 J			0.14		1.4		1.2		0.22 J		200		2.6	608.75	595.75
	8/14/2018	14						1.5		1.4				200		1.9	625.24	614.24
OSW-5 P6	9/25/2013	19						6.1		0.76	19		220		1.7	755.65	748.15	
	9/25/2013	20						7.1		1.2	22		260		1.6	837.82	831.82	
	12/6/2013	18		4.1				5.7		1.2	16		240		1.8	895.245	744.25	
	4/29/2014	Lower Bedrock	45						2.1		2.3	1.1	0.33	340		2.4	1280.55	1080.55
	7/7/2014	529 - 539	47						2.7		2.1	1.3	0.26	390		4	1134.72	1125.62
	10/15/2014	25							1.9		0.22			320		2.1	945.11	936.61
	11/17/2017	23	0.62 J			0.16		3.4		2.2	0.30 J	0.25 J		370	0.59 J	3.5	1043.74	1028.74
	8/14/2018	21						3.2		2.3		0.28		330		3.1	984.57	975.87
OSW-6 P1	9/25/2013							1.3							3.75	1.45		
	12/6/2013	14					9.1	3	0.27	0.42	7.2		65		2	705.1	195.10	
	4/29/2014		Upper						0.37		0.17			0.31		110.85	0.85	
	4/29/2014	Permeable							0.41					0.37		9.38	0.78	
	7/8/2014	205 - 215							0.35					0.28		2.53	0.63	
	10/15/2014								0.3					0.81		4.126	1.83	
	11/16/2017								0.73 J							4.03	0.73	
	8/14/2018								0.87							3.17	0.87	
OSW-6 P2	9/25/2013							0.28			1.9		0.14		5.29	3.29		
	12/6/2013							0.19			0.92		0.11			241.7	1.70	
	4/29/2014		Principal											0.13		16.24	0.24	
	7/8/2014	264 - 274												0.28		2.1	0.30	
	10/15/2014															2.37	0.57	
	11/16/2017															1.4	0.00	
	8/14/2018															5.2	0.00	
OSW-6 P3	9/25/2013										1.6		0.16		3.3	2.56		
	12/6/2013										0.41		0.23			68.57	1.27	
	4/29/2014		Principal								0.57					257.37	1.37	
	7/8/2014	342 - 352														1.63	0.65	
	10/15/2014															1.34	0.68	
	11/16/2017															0.68	0.21	
OSW-6 P4	9/25/2013													17	0.11	19.51	19.51	
	12/6/2013													1		125.34	1.34	
	4/29/2014		Principal												0.11	0.77	0.00	
	7/8/2014	415 - 425													0.17	1.08	0.22	
	10/15/2014															0.356	0.356	
	11/16/2017															0.52	0.00	
OSW-6 P5	9/25/2013															29.67	29.00	
	12/6/2013															138.974	4.97	
	4/29/2014		Lower Bedrock													53.8	0.80	
	7/8/2014	458 - 468														0.23	0.23	
	10/15/2014															0.086	0.086	
	11/16/2017															0.66	0.26	

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(All values ug/l)

Sample Location	Sample Date	Water bearing zone and depth below ground surface.	1,1,1-TRI	1,1,2-TRI	1,1-DI	1,1-DI	1,2,4-TRI	1,2-DI	BROMO	1,2-	DIBROMO-3-	1,2-DI	1,2-DI	1,3-DI	1,4-DI	BROMO	CARBON	
			CHLORO	CHLORO	CHLORO	ETHENE	BENZENE	DIBROMIDE)	ETHANE	(ETHYLENE	CHLOROPRO	BENZENE	CHLORO	PROPANE	BENZENE	CHLORO	DICHLORO	CARBON
NJGWQS		30	3	50	1	9	0.03	0.02	600	2	1	600	75	0.4	6000	1	1	700
OSW-7 P1	5/15/2017	Upper													0.99	0.16 J		1.3
	8/7/2017	Permeable													18	20		1
	11/17/2017		50 - 60												0.84			1
	8/15/2018														1.1			1.2
OSW-7 P2	5/15/2017	Upper													2.7	0.18 J		0.95 J
	8/7/2017	Permeable													39	8.8		0.6 J
	11/17/2018		185 - 195												140	84		0.44
	8/15/2018														0.54			
OSW-7 P3	5/15/2017	Principal													2.8	0.13 J	0.38 J	1.9
	8/7/2017	Principal													4.7	3.8 J	0.12 J	0.55 J
	11/17/2017		290 - 300												130	99	0.093 J	
	8/15/2018														0.68			
OSW-7 P4	5/15/2017	Principal													1.4	0.19 J		1.4
	8/7/2017	Principal													4.5	4.8 J	0.15 J	0.68 J
	11/17/2017		430 - 440												0.75	1.8 J	0.12 J	0.38 J
	8/15/2018														0.99			
OSW-7 P5	5/15/2017	Lower Bedrock													0.63	0.33 J		2.6
	8/7/2017	Lower Bedrock													3.6	4 J	0.12 J	0.46 J
	11/17/2017		460 - 470												210	190	0.11 J	
	8/15/2018														1.5			
OSW-7 P6	5/15/2017	Lower Bedrock													0.74	0.12 J		1.5
	8/7/2017	Lower Bedrock													4.5	3.4 J	0.12 J	0.32 J
	11/17/2017		510 - 520												260	220	0.32 J	
	8/15/2018														0.74			
OSW-7 P7	5/15/2017	Lower Bedrock													1.8			0.6 J
	8/7/2017	Lower Bedrock													3.2	2.6 J		
	11/17/2017		530 - 540												0.41			
OSW-8 P1	5/15/2017	Upper													6.2	8.1	0.40 J	1.7
	8/7/2017	Permeable													4.2	6.1		0.31 J
	11/17/2017		65 - 75												1.9			
	8/15/2018														3.9			
OSW-8 P2	5/15/2017	Upper													3.3		0.69 J	1.8
	8/7/2017	Permeable													16		0.72 J	2
	11/17/2017		160 - 170												1.3		0.83 J	2.1
	8/15/2018														9.9	10	0.85	1.9
OSW-8 P3	5/15/2017	Principal							0.44 J						1.2	0.13 J	0.22 J	4
	8/7/2017	Principal							0.32 J						12	5.2		5.3
	11/17/2017		255 - 265												1.7			6.5
	8/15/2018														1.7		7	9.5
OSW-8 P4	5/15/2017	Principal						0.46 J	0.61 J						0.79	0.48 J	0.39 J	1.8
	8/7/2017	Principal							0.27 J						1.6	3.8 J	0.30 J	4.4
	11/17/2017		350 - 360						0.25 J						0.65	7.6	0.20 J	1.6
	8/15/2018														1.3			1.1
OSW-8 P5	5/15/2017	Principal							0.27 J						6.2		0.47 J	1.8
	8/7/2017	Principal													4	5.2		0.95 J
	11/17/2017		445 - 455												2.9			0.80 J
	8/15/2018														4.9			0.53
OSW-8 P6	5/15/2017	Lower Bedrock													0.87	.032 J		3
	8/7/2017	Lower Bedrock													1.1	2.7 J	0.23 J	2
	11/17/2017		470 - 485												150 D	26	0.22 J	1.4
	8/15/2018														1.8			1
OSW-8 P7	5/15/2017	Lower Bedrock													1.3	0.34 J		1.9
	8/7/2017	Lower Bedrock													8.6	4.4 J	0.20 J	1.6
	11/17/2017		528 - 543												6.4	6.4		1.1
	8/15/2018														11			

TABLE 3
DETECTED VOCs IN OSW SERIES MONITORING WELLS
(All values ug/l)

Sample Location	Sample Date	Water bearing zone and depth below ground surface.	CIS-1,2-DI CHLORO ETHYLENE	CYCLO HEXANE	DIBROMO CHLORO METHANE	DICHLORO DIFLUORO XYLENES, TOTAL	DIMETHYL BENZENE/ XYLEMIDE	METHYL ETHYL KETONE (2-BUTA BUTYL TETRA	TETRA	TRI	TRI	TVO (w/o 1,4 Dioxane and Acetone)*						
			70	1	1000	1000	0.03	300	3	70	1	600	100	1	2000	20000	1	TVO*
NJGWQS																		
OSW-7 P1	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Upper Permeable 50 - 60										0.41 J 0.32 J 0.29 J					2.86 39.32 2.13 2.3	1.87 1.32 1.29 1.20
OSW-7 P2	5/15/2017 8/7/2017 11/17/2018 8/15/2018	Upper Permeable 185 - 195							2.4 J	0.26 J		5.4 4 0.69 J		0.28 J			9.23 52.68 227.35 0.98	6.53 4.88 3.35 0.44
OSW-7 P3	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Principal 290 - 300										10 6.4 5.2	29 24 2.5				44.21 40.09 237.043 0.68	41.41 31.59 8.04 0.00
OSW-7 P4	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Principal 430 - 440							4.6 J 5.7			26 14					33.59 29.83 3.05 0.99	32.19 20.53 0.50 0.00
OSW-7 P5	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Lower Bedrock 460 - 470							8.3 5 7.4	0.21 J 0.26 J		20 10					31.86 23.39 407.77 1.5	31.23 15.79 7.77 0.00
OSW-7 P6	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Lower Bedrock 510 - 520							19 8.1 11	0.28 J		18 5.1					39.36 21.79 491.6 0.74	38.62 13.89 11.60 0.00
OSW-7 P7	5/15/2017 8/7/2017 11/17/2017	Lower Bedrock 530 - 540							5.7			10 0.40 J					18.1 6.2 0.41	16.30 0.40 0.00
OSW-8 P1	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Upper Permeable 65 - 75								0.24 J		0.54 J 0.32 J 0.27 J					16.94 11.17 3.17 3.9	2.64 0.87 0.27 0.00
OSW-8 P2	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Upper Permeable 160 - 170										2.8 0.62 J 1 0.95	1 1 1 0.95				9.59 20.34 5.23 23.6	6.29 4.34 3.93 3.70
OSW-8 P3	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Principal 255 - 265	1.2 0.80 J 0.64 J 1.1				7.4 4.8 J 2.4 J	0.32 J		9.8 5.2 1.4 12		9 12	0.14 J		44.53 55.94 33.14 30.6	43.33 38.74 31.44 28.90		
OSW-8 P4	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Principal 350 - 360	2.8 1.1 0.62 J 1.4				9.4 8.9 5.7 3.3	0.33 J 0.24 J		15 20 1.8 2		4.8 2.9 2.2 2	0.35 J		43.78 44.8 22.76 10.8	42.99 39.40 14.51 9.50		
OSW-8 P5	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Principal 445 - 455	2 2 2 1.6				3.3 J 0.23 J	0.67 J 0.65 J		11 13 2.3 2.4		3.5 3.2 3.1 2.4			25.24 32.32 11.98 10.08	19.04 23.12 9.08 5.18		
OSW-8 P6	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Lower Bedrock 470 - 485	0.55 J 0.32 J 0.32 0.33				4.7 J 5 3.2 J	0.27 J		26 8.6 3.2		0.77 J 0.50 J 0.32 J			35.922 20.72 184.34 3.13	35.05 16.92 8.34 1.33		
OSW-8 P7	5/15/2017 8/7/2017 11/17/2017 8/15/2018	Lower Bedrock 528 - 543					7.9	0.22 J 0.33 J	0.57 J	29 15 0.52 J		0.29 J 0.22 J			41.52 30.35 14.42 11	40.22 17.35 1.62 0.00		

Shaded values exceed New Jersey Groundwater Quality Standard

TABLE 4
GROUNDWATER ELEVATIONS
OSW-1 - OSW-8

Well	Reference	3/1/2018		6/6/2018		9/7/2018	
	Elevation (ft., msl)	DTW (ft.)	Elev. (ft., msl)	DTW (ft.)	Elev. (ft., msl)	DTW (ft.)	Elev. (ft., msl)
OSW-1 P1	82.93	21.01	61.92	21.37	61.56	23.65	59.28
OSW-1 P2	82.93	21.03	61.9	22.42	60.51	24.65	58.28
OSW-1 P3	82.93	21.09	61.84	22.66	60.27	25.4	57.53
OSW-1 P4	82.95	20.39	62.56	22.59	60.36	25.44	57.51
OSW-1 P5	82.95	21.27	61.68	22.84	60.11	25.85	57.1
OSW-2 P1	77.46	15.49	61.97	15.82	61.64	18.02	59.44
OSW-2 P2	77.47	15.66	61.81	16.02	61.45	18.27	59.2
OSW-2 P3	77.45	15.33	62.12	17.01	60.44	19.8	57.65
OSW-2 P4	77.47	15.28	62.19	16.98	60.49	19.79	57.68
OSW-2 P5	77.46	15.31	62.15	17	60.46	19.87	57.59
OSW-2 P6	77.48	15.75	61.73	17.45	60.03	20.5	56.98
OSW-3 P1	74.8	12.58	62.22	12.99	61.81	15.27	59.53
OSW-3 P2	74.8	12.77	62.03	13.15	61.65	15.47	59.33
OSW-3 P3	74.79	12.64	62.15	14.45	60.34	17.22	57.57
OSW-3 P4	74.83	12.49	62.34	14.4	60.43	17.08	57.75
OSW-3 P5	74.77	12.31	62.46	14.17	60.6	17.12	57.65
OSW-3 P6	74.74	11.58	63.16	13.67	61.07	17.12	57.62
OSW-4 P1	72.68	10.47	62.21	10.92	61.76	13.24	59.44
OSW-4 P2	72.66	9.76	62.9	11.68	60.98	14.61	58.05
OSW-4 P3	72.66	9.75	62.91	11.66	61	14.64	58.02
OSW-4 P4	72.68	9.1	63.58	0.72	71.96	14.69	57.99
OSW-4 P5	72.64	8.3	64.34	10.57	62.07	14.53	58.11
OSW-5 P1	80	18.91	61.09	18.65	61.35	20.64	59.36
OSW-5 P2	79.95	18.49	61.46	18.63	61.32	20.78	59.17
OSW-5 P3	80	17.69	62.31	19.29	60.71	22.07	57.93
OSW-5 P4	79.95	17.63	62.32	19.3	60.65	22.11	57.84
OSW-5 P5	80	17.59	62.41	19.38	60.62	22.2	57.8
OSW-5 P6	80	17.55	62.45	19.15	60.85	22.08	57.92
OSW-6 P1	75.62	13.81	61.81	14.05	61.57	16.29	59.33
OSW-6 P2	75.57	12.92	62.65	14.68	60.89	17.55	58.02
OSW-6 P3	75.57	12.9	62.67	14.68	60.89	17.58	57.99
OSW-6 P4	75.57	12.82	62.75	14.65	60.92	17.59	57.98
OSW-6 P5	75.57	12.04	63.53	14.15	61.42	17.59	57.98
OSW-7 P1	79.85	18.05	61.8	18.35	61.5	20.2	59.65
OSW-7 P2	79.83	18	61.83	18.35	61.48	20.34	59.49
OSW-7 P3	79.81	17.89	61.92	18.2	61.61	20.34	59.47
OSW-7 P4	79.78	17.83	61.95	18.16	61.62	17.82	61.96
OSW-7 P5	79.78	16.93	62.85	18.34	61.44	21.15	58.63
OSW-7 P6	79.82	17.29	62.53	18.72	61.1	21.07	58.75
OSW-7 P7	79.84	17.69	62.15	19.15	60.69	21.99	57.85
OSW-8 P1	82.48	21.18	61.3	21.44	61.04	23.21	59.27
OSW-8 P2	82.53	21.12	61.41	21.48	61.05	23.38	59.15
OSW-8 P3	82.52	21.05	61.47	21.41	61.11	23.43	59.09
OSW-8 P4	82.46	20.9	61.56	21.27	61.19	23.34	59.12
OSW-8 P5	82.51	20.94	61.57	21.32	61.19	23.45	59.06
OSW-8 P6	82.52	19.5	63.02	21.08	61.44	24.02	58.5
OSW-8 P7	82.53	18.8	63.73	20.07	62.46	22.71	59.82



Map Source: Bing Maps

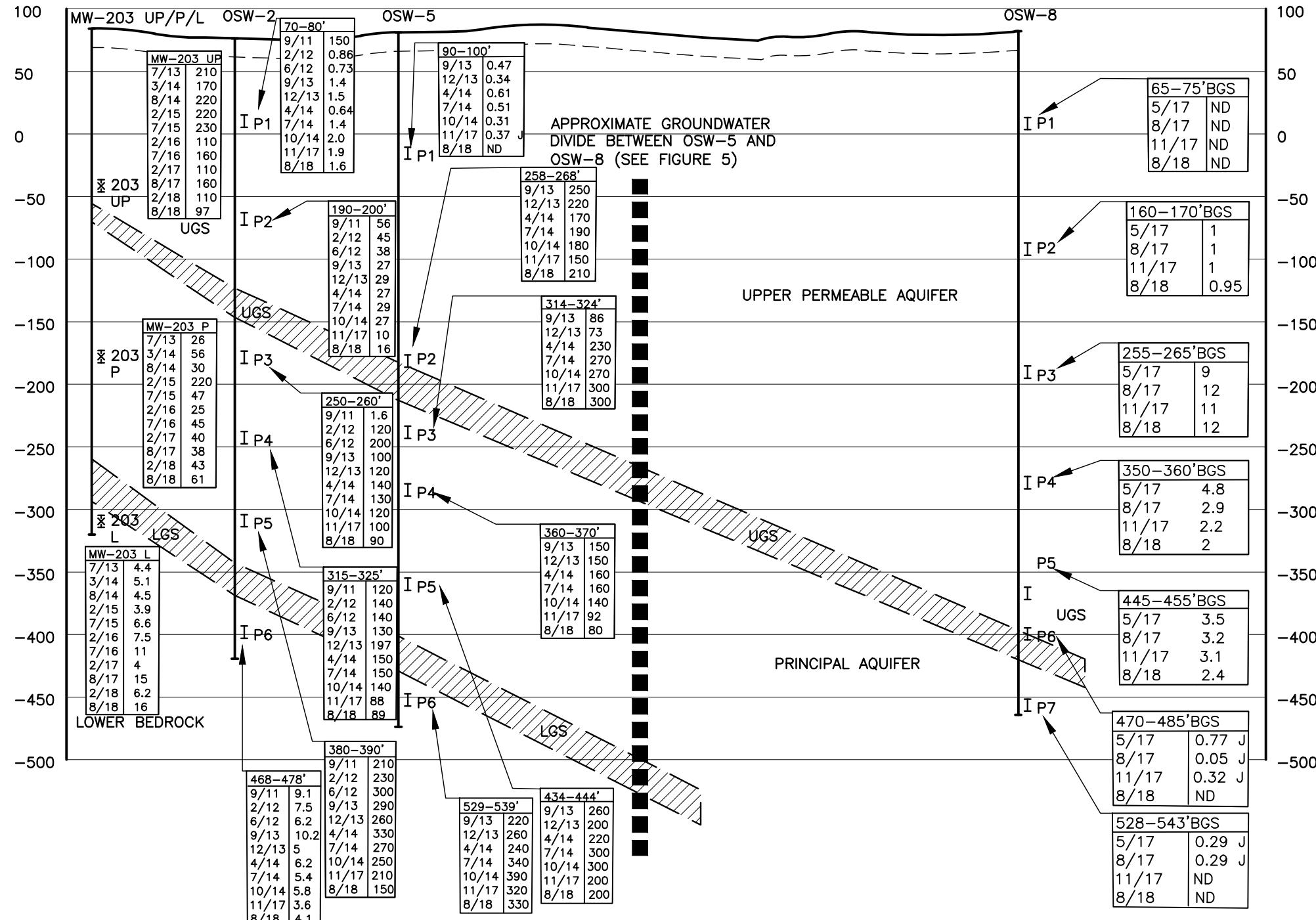


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Off Site Monitoring Well Locations Chemsol Superfund Site

FIGURE NO.

1



LEGEND:

	203 UP	SCREENED MONITORING WELL INTERVAL
	P2	FLUTE SAMPLING PORT INTERVAL
	UGS	UPPER GREY SHALE
	LGS	LOWER GREY SHALE
(1.9)		TRICHLOROETHENE CONCENTRATION (ug/l)
ND		NOT DETECTED

HORIZONTAL SCALE IN FEET

VERTICAL SCALE IN FEET

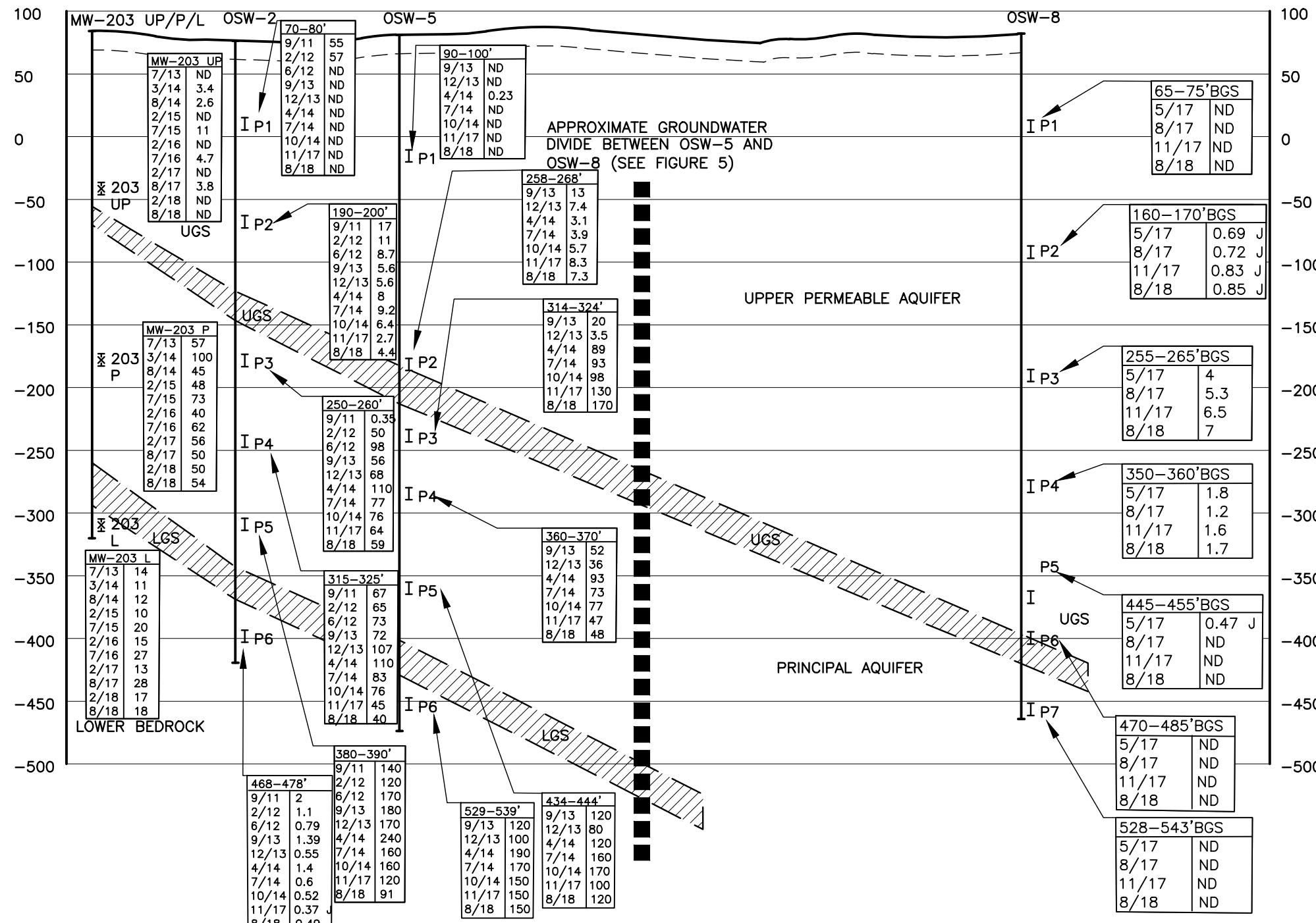


CHEMSOL, INC.
SUPERFUND SITE

CROSS-SECTION THROUGH OFF-SITE WELL LOCATIONS WITH TRICHLOROETHENE CONCENTRATIONS

FIGURE NO.
2

PROJECT NO.
160688



LEGEND:

	SCREENED MONITORING WELL INTERVAL
	FLUTE SAMPLING PORT INTERVAL
	UGS
	LGS
(1.9)	CARBON TETRACHLORIDE CONCENTRATION (ug/l)
ND	NOT DETECTED
0 500 1000	HORIZONTAL SCALE IN FEET
0 100 200	VERTICAL SCALE IN FEET



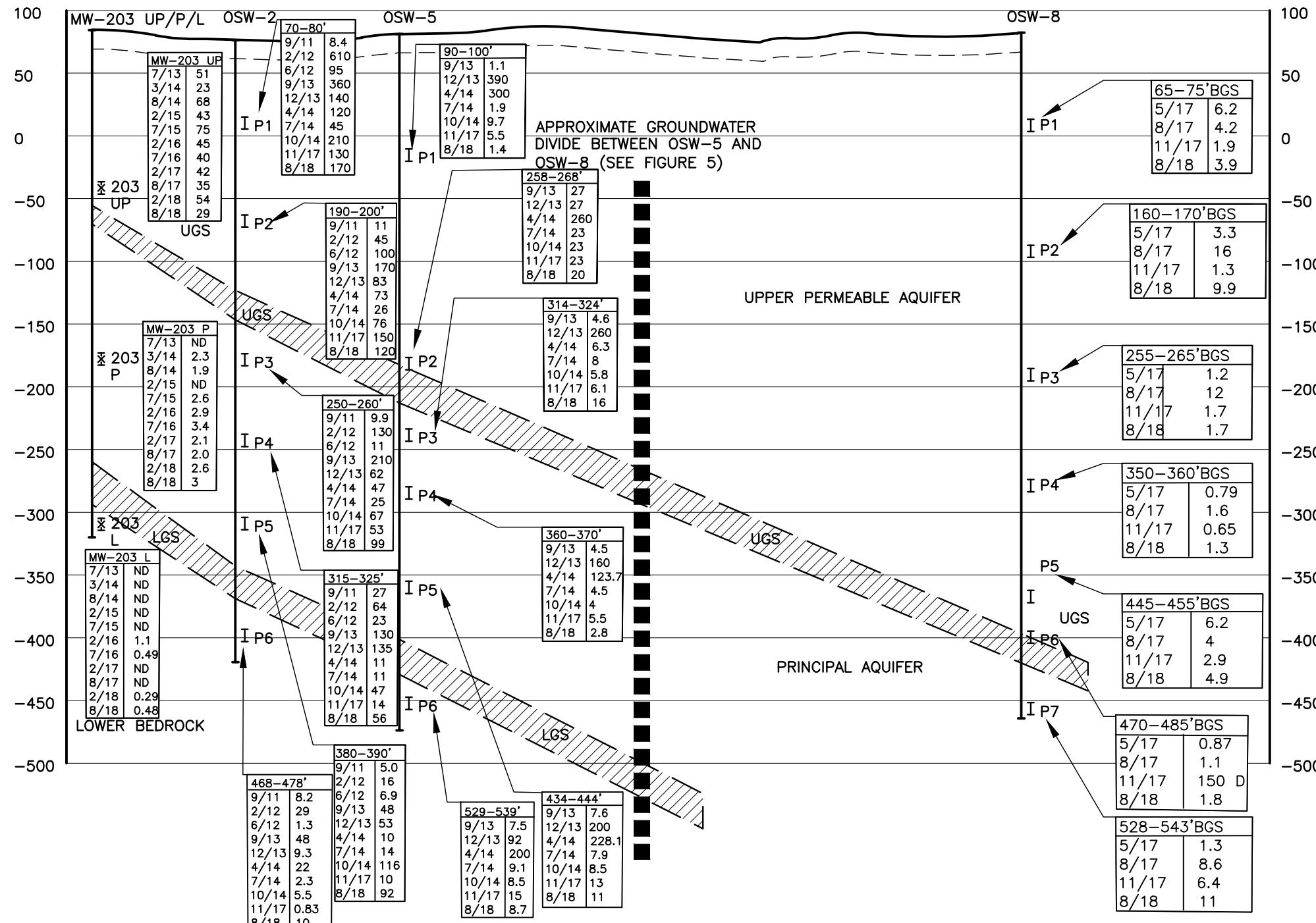
CHEMSOL, INC.
SUPERFUND SITE

CROSS-SECTION THROUGH OFF-SITE WELL LOCATIONS WITH CARBON TETRACHLORIDE CONCENTRATIONS

FIGURE NO.
3

PROJECT NO.
160688

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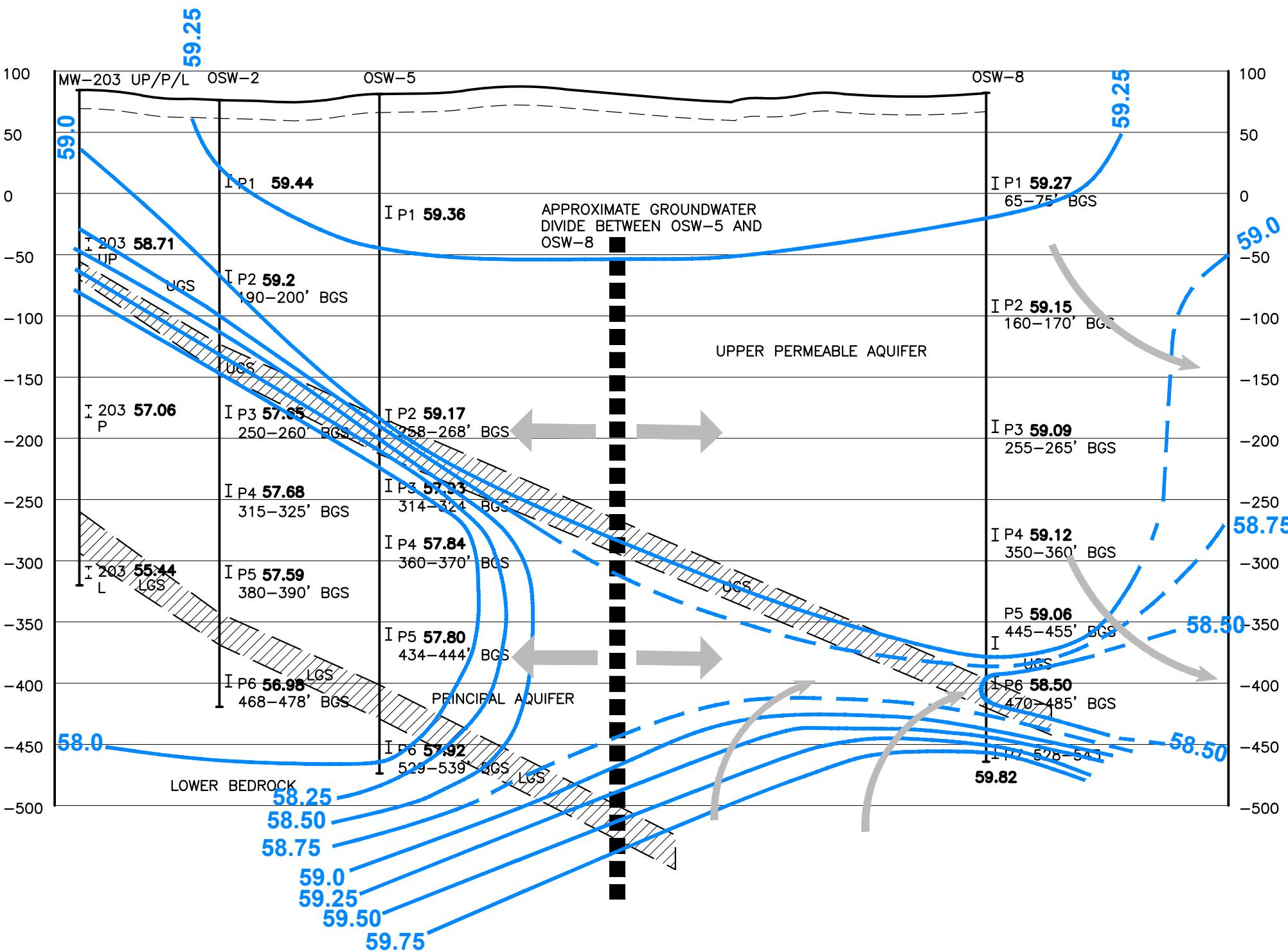
LEGEND:

	203 UP	SCREENED MONITORING WELL INTERVAL
	P2	FLUTE SAMPLING PORT INTERVAL
	UGS	UPPER GREY SHALE
	LGS	LOWER GREY SHALE
(1.9)		1,4 DIOXANE CONCENTRATION (ug/l)
ND		NOT DETECTED

CHEMSOL, INC.
SUPERFUND SITE

CROSS-SECTION THROUGH OFF-SITE WELL LOCATIONS WITH 1,4 DIOXANE CONCENTRATIONS

FIGURE NO. 4
PROJECT NO. 160688



LEGEND:

203 UP	SCREENED MONITORING WELL INTERVAL
P2	FLUTE SAMPLING PORT INTERVAL
UGS	UPPER GREY SHALE
LGS	LOWER GREY SHALE
59.75	EQUIPOTENTIAL LINE (SEPTEMBER 7, 2018) DASHED WHERE INFERRED
59.0	APPROXIMATE GROUNDWATER FLOW DIRECTION
0 500 1000	HORIZONTAL SCALE IN FEET
0 100 200	VERTICAL SCALE IN FEET

CHEMSOL, INC.
SUPERFUND SITE

OFF-SITE (OU-3) CROSS-SECTION AND
EQUIPOTENTIAL CONTOURS (SEPT 7, 2018)

FIGURE NO.
5

PROJECT NO.
160688

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